What Is Claimed Is:

1. A substrate temperature control device comprising a flat plate-shaped stage having a main surface facing a substrate, wherein said stage has a flat plate-shaped container, and said container comprises: a cavity for flow of working fluid; an inlet for inflow of said working fluid into said cavity; an outlet for discharge of said working fluid from said cavity; and turbulence structure for creating turbulence of said working fluid within said cavity.

2. The substrate temperature control device of claim 1 wherein said turbulence structure comprises within said cavity a plurality of ribs connecting the wall on the side of said main face of said container, and the wall on the opposite side.

3. The substrate temperature control device of claim 1 wherein said turbulence structure comprises a jet aperture for converting said working fluid into a jet when it flows into said cavity.

4. The substrate temperature control device of claim 1 wherein said turbulence structure comprises a swirling mechanism for directing said working fluid in a swirling direction when it flows into said cavity.

5. The substrate temperature control device of claim 1 wherein the arrangement of said inlet and outlet is one or other of the following (1), (2) and (3):

(1) said inlet is provided in a peripheral region of said container, and said outlet is provided in a central region of said container;

(2) said inlet is provided in a central region of said container and said outlet is provided in a peripheral region of said container; or

(3) said inlet and said outlet are respectively provided in a peripheral region of said container.

6. The substrate temperature control device of claim 5 wherein said inlet is provided in the peripheral wall of said container so as to face a direction parallel to the wall of said main surface of said container.

7. The substrate temperature control device of claim 5 wherein said inlet is provided in said peripheral region and said peripheral region extends beyond the periphery of said substrate.

8. The substrate temperature control device of claim 1 wherein said stage is further provided with sheet-shaped heaters arranged on a face on said main face side and a face on the opposite side of said container.

9. The substrate temperature control device of claim 8, further comprising a working fluid system for supplying said working fluid to said container, this working fluid system supplying only working fluid for substrate cooling.

10. A substrate temperature control device comprising a flat plate-shaped stage having a main surface facing a substrate, whrein said stage has a flat plate-shaped container, and said container comprises: a cavity for flow of working fluid; an inlet for inflow of said working fluid into this cavity; and an outlet for discharge of said working fluid from said cavity; the arrangement of said inlet and outlet being one or other of the following (1), (2) and (3):

(1) said inlet is provided in a peripheral region of said container, and said outlet is provided in a central region of said container;

(2) said inlet is provided in a central region of said container and said outlet is provided in a peripheral region of said container; or

(3) said inlet and said outlet are respectively provided in a peripheral region of said container.

11. The substrate temperature control device of claim 10 wherein said container is further provided with turbulence structure for creating turbulence of said working fluid within said cavity.

12. The substrate temperature control device of claim 10 wherein said stage is further provided with sheet-shaped heaters arranged on a face on said main face side and a face on the opposite side of said container.

13. The substrate temperature control device of claim 12, further comprising a working fluid system for supplying said working fluid to said container, this working fluid system supplying only working fluid for substrate cooling.

14. A substrate temperature control device comprising a flat plate-shaped stage having a main surface facing a substrate, wherein said stage has a flat plate-shaped container and said container comprises: a cavity for flow of working fluid, and within said cavity a plurality of ribs connecting the wall on the side of said main face of said container and the wall on the opposite side.

15. The substrate temperature control device of claim 14 wherein said container further comprises turbulence structure for generating turbulence of said working fluid within said cavity.

16. The substrate temperature control device of claim 14 wherein said container comprises: an inlet for inflow of said working fluid into said cavity; an outlet for discharge of said working fluid from said cavity; and the arrangement of said inlet and outlet is one or other of the following (1), (2) and (3):

(1) said inlet is provided in a peripheral region of said container, and said outlet is provided in a central region of said container;

(2) said inlet is provided in a central region of said container and said outlet is provided in a peripheral region of said container; or

(3) said inlet and said outlet are respectively provided in a peripheral region of said container.

17. The substrate temperature control device of claim 14 wherein said stage is further provided with sheet-shaped heaters arranged on a face on said main face side and a face on the opposite side of said container.

18. The substrate temperature control device of claim 15, further comprising a working fluid system for supplying said working fluid to said container, this working fluid system supplying only working fluid for substrate cooling.

19. A substrate temperature control device comprising a flat plate-shaped stage having a main surface facing a substrate, wherein said stage comprises a flat plate-shaped container having in its interior a cavity for

flow of working fluid and sheet-shaped heaters arranged on both a face on said main face side and a face on the opposite side of said container.

20. The substrate temperature control device of claim 19 wherein said container comprises, within said cavity, a plurality of ribs connecting the wall on the side of said main face of said container and the wall on the opposite side.

21. The substrate temperature control device of claim 19 wherein said container further comprises turbulence structure for generating turbulence of said working fluid within said cavity.

22. The substrate temperature control device of claim 19 wherein said container comprises: an inlet for inflow of said working fluid into said cavity; an outlet for discharge of said working fluid from said cavity; and the arrangement of said inlet and outlet is one or other of the following (1), (2) and (3):

(1) said inlet is provided in a peripheral region of said container, and said outlet is provided in a central region of said container;

(2) said inlet is provided in a central region of said container and said outlet is provided in a peripheral region of said container; or

(3) said inlet and said outlet are respectively provided in a peripheral region of said container.

23. The substrate temperature control device of claim 19 further comprising a working fluid system for supplying said working fluid to said container, this working fluid system supplying only working fluid for substrate cooling.

24. A substrate temperature control device comprising a stage for carrying a substrate, said stage comprising a container having in its interior a flow path that extends in a region directly below said substrate, and said container comprising an inlet in a peripheral region of said flow path whereby a working fluid is made to flow into said flow path.

25. The substrate temperature control device of claim 24 wherein said container comprises at least one outlet in the peripheral region of said flow path for allowing working fluid to flow out from said flow path.

26. The substrate temperature control device of claim 25 wherein said inlets and outlets are arranged alternately along the periphery of said flow path.

27. The substrate temperature control device of claim 24 wherein said flow path is divided into a plurality of small flow paths, said plurality of small flow paths being respectively connected to said plurality of inlets such that working fluid flows in mutually opposite directions in adjacent small flow paths.

28. The substrate temperature control device of claim 26 wherein said flow path is divided into a plurality of outgoing flow paths for making working fluid to flow from the peripheral region of said flow path towards the central region and a plurality of return flow paths for making working fluid to flow from the central region of said flow path towards the peripheral region, said outgoing flow paths and return flow paths mutually communicating in the central region of said flow path and being arranged alternately, said outgoing flow paths being respectively

connected to respective said inlets in said peripheral region and said return flow paths being respectively connected to respective said outlets in said peripheral region.

29. The substrate temperature control device of claim 26 wherein said flow path is divided into a plurality of elongate small flow paths that run parallel to each other, said small flow paths being classified into ascending flow paths and descending flow paths whose flow directions are mutually opposite, said ascending flow paths and said descending flow paths being alternately arranged, said respective ascending flow paths being connected on one side of said peripheral region with said respective inlets, and on the other side of said peripheral region with said respective outlets, said respective descending flow paths being connected on one side of said peripheral region with said respective outlets, and on the other side of said peripheral region with said respective inlets.

30. The substrate temperature control device of claim 24 wherein a large number of fins are arranged in said flow path.

31. The substrate temperature control device of claim 24 wherein cotton-like or gauze-like fiber bodies are arranged in said flow path.

32. The substrate temperature control device of claim 24 wherein said stage is further provided with a flat plate-shaped heat pipe joined to the upper surface of said container.

33. The substrate temperature control device of claim 24 wherein said stage is further provided with an electric heating wire heater stuck to one or both of the upper surface and under-surface of said container.

34. The substrate temperature control device of claim 24 wherein said stage comprises two said containers arranged one on top of the other, the directions of flow of working fluid in said two containers being mutually opposite between the containers.

35. A substrate temperature control device comprising a stage for carrying a substrate, said stage comprising a container having in its interior a cavity that extends in a region directly below said substrate, said container comprising an inlet provided in a peripheral region of said container for supplying a working fluid to said cavity, an outlet provided in a peripheral region of said container for discharging said working fluid from said cavity, and one or a plurality of guide walls that partition said cavity, and bent flow paths being formed within said cavity by said guide walls.

36. The substrate temperature control device of claim 35 wherein a large number of fins or ribs are arranged within said cavity.

37. The substrate temperature control device of claim 35 wherein said guide walls are provided with one or a plurality of bypass holes.

38. The substrate temperature control device of claim 37 wherein said bypass holes are provided in the vicinity of the bending locations of said plurality of flow paths.

39. The substrate temperature control device of claim 35 wherein said working fluid flows with approximately uniform speed along the entire length of said bent flow paths formed by said guide walls.

40. The substrate temperature control device of claim 35 wherein said guide walls cause the working fluid from said inlet to circulate through said cavity after guiding the same to the vicinity of said outlet.

41. The substrate temperature control device of claim 40 wherein said guide walls guide the flow at the center of said cavity towards both sides or guide the flow at the periphery of said cavity towards the center of said cavity.

42. The substrate temperature control device of claim 35 wherein said container is provided with said inlet and said outlet in approximately the same place.

43. The substrate temperature control device of claim 35 wherein sheet-shaped heaters are joined to the upper surface and under-surface of said container and said entire stage is constituted so as to be substantially vertically symmetrical.

44. The substrate temperature control device of claim 1, wherein a sheet-shaped heater is provided within said container, and said entire stage is substantially vertically symmetrical.

45. The substrate temperature control device of claim ~~46~~ 44 wherein said inlets or said outlets are vertically symmetrically arranged.

46. A substrate temperature control device comprising a stage for carrying a substrate is , said stage comprising two containers having in their interiors cavities which extend in the region directly below said substrate, one or both of said containers comprising an inlet that supplies working fluid to said cavity and an outlet that discharges said working

fluid from said cavity, and a sheet-shaped heater being interposed between said two containers.

47. The substrate temperature control device of claim 46 wherein said inlets or said outlets are vertically symmetrically arranged.